

REMARKS

Applicants have amended claims 14, 27, 36, 45, 47, 48, 49, and 51 and add new claims 53-59 as set forth above. Applicants note with appreciation the Office's indication that claims 9-13, 22-26, 31-35, 40-44, and 51 are allowed and claim 47 will be allowed if amended to overcome the objection set forth below. Applicants respectfully request clarification with respect to the status of dependent claim 48 which depends from independent claim 47 because the Office has indicated claim 47 is allowable if the objection to claim 47 is corrected. Applicants have also corrected a typographical error which resulted in the inclusion of the phrase, "with a mode profile" in claims 49 and 51 as set forth above. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has objected to amended claims 45 and 47 asserting they each recite that the structure focuses a portion of the light incident thereon onto a portion of the elliptical shaped mirror and the mirror directs the portion of light onto another portion of the structure. However, the Office asserts the structure does not actually focus light onto the elliptical mirror, but merely directs it there (see fig. 3) and each elliptical mirror focuses the portion of light onto the structure rather than just directing it there. The Office asserts to remedy the objections, claim 45 should be amended so that line 7 recites "the structure directing" and line 8 recites "the elliptical shaped mirror focusing" and corresponding changes should be made to claim 47.

Accordingly, Applicants have amended claim 47 in accordance with the Office's suggestions and have amended claim 45 to replace, "the structure focusing" with, "the structure reflecting" and has, "the elliptical shaped mirror directing" with, "the elliptical shaped mirror focusing." Support for this amendment to claim 45 can be found in paragraph 39 in the above-identified patent application. In view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the objection to claims 45 and 47.

The Office has rejected claims 1-5, 7-8, 14-18, 20-21, 27, 29-30, 36, and 38-39 under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication No. US 2001/0009541 to Ueyanagi (Ueyanagi). The Office asserts Ueyanagi discloses a system

(figs. 1 or 6) with: an optical element 6; at least one structure 8 at least partially in a non-opaque portion of the optical element and at least adjacent a surface of the optical element; and a source 2 of light with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element, the source positioned to propagate at least a portion of the light through the optical element onto an object 12, the structure 8 enhancing the electric field of the light which optically interacts with the object. See e.g. [0042], [0044], [0055], and [0059]-[0063]. Note that in the embodiment of fig. 1F, the structure 8 has at least one pointed tip (i.e. any of the four roughly 60 degree angles encompassing the shaded areas).

Ueyanagi does not disclose or suggest, “a source of light with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element” as recited in claim 1 and “with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element” as recited in claim 14. The Office’s attention is respectfully directed to paragraphs 42 and 43 in Ueyanagi which merely disclose that a semiconductor laser 2 emits a laser beam 2a and that a red laser (630 nm) or an AlGaInN blue laser (400 nm) could be used. Accordingly, Ueyanagi only teaches the use of laser light, but does not disclose or suggest a source of light with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element as claimed. Applicants respectfully request the Office to specifically identify support for its assertion that the laser light mentioned in Ueyanagi teaches the claimed limitations or withdraw this rejection.

In sharp contrast, the present invention discloses in paragraph 32 in the above-identified patent application that, “The electric field component of the focused light 24 perpendicular to the surface of the solid immersion lens 16(1), referred to as the longitudinal field, creates a highly localized enhanced field at the surface of the lens 16(1) by the structure 18(1). Since the structure 18(1) is in the vicinity of the surface 26 of the object 12, the enhanced field 34 protrudes into the space outside the solid immersion lens 16(1) thereby enabling a highly localized interaction with the surface 26 of the object which is close by. The lateral extent of the enhanced field 34 is smaller than the size of diffraction illumination

and can reach down to about ten nm.” Accordingly, with the present invention with the claimed light source the lateral extent of the field can reach about 10 nm.

Therefore, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 1 and 14. Since claims 2-5 and 7-8 depend from and contain the limitations of claim 1 and claims 15-18 and 20-21 depend from and contain the limitations of claim 14, they are distinguishable over the cited references and are patentable in the same manner as claims 1 and 14.

Ueyanagi does not disclose or suggest, “wherein the structure is elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one tapered end tip adjacent the surface of the optical element” as recited in claim 27, or “wherein the structure is formed to be elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one tapered end tip adjacent the surface of the optical element” as recited in claim 36, or “wherein the structure is elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one pointed tip adjacent the surface of the optical element” as recited in claims 54 and 56.

The Office’s attention is respectfully directed to paragraph 55 in Ueyanagi which states, “The micro metal member 8 is embedded in the light condensing surface 6b of the transparent condensing medium 6 as shown in FIG. 1A.” As clearly shown in FIG. 1F in Ueyanagi, the flat side of the trapezoidal shaped, pair of metal members 8a and 8b is flush against the light-condensed surface 6b. The metal members 8a and 8b in Ueyanagi do not being to taper in from a location spaced in from the light-condensed surface 6b and do not converge to one pointed tip adjacent the light-condensed surface 6b.

As discussed in paragraphs 38 and 39 in the above-identified patent application, by shaping the structure to have one pointed tip a highly localized, enhanced field can be provided. This enhanced field which results from the pointed tip allows for a

highly localized interaction with the surface 26 of the object 12. Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 27, 36, 4, and 56. Since claims 29-30 depend from and contain the limitations of claim 27, claims 38-39 depend from and contain the limitations of claim 36, claim 55 depends from and contains the limitations of claim 54, and claim 57 depends from and contains the limitations of claim 56, they are distinguishable over the cited references and are patentable in the same manner as claims 27, 36, 54, and 56.

The Office has rejected claims 1-3, 5-7, 14-16, 18-20, 27-29, and 36-38 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,994,818 to Keilmann (Keilmann). The Office asserts Keilmann discloses a system (fig. 3) comprising: an optical element 10; at least one structure 20 at least partially in a non-opaque portion 22 of the optical element and at least adjacent a surface of the optical element, wherein the structure has at least one pointed tip; and a source of light 16 with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element, the source positioned to propagate at least a portion of the light through the optical element onto an object, the structure 20 enhancing the electric field of the light which optically interacts with the object. The non-opaque portion includes a material (polyethylene in the reference example) which insulates the structure 20 and which is transparent at the wavelength of light 16. See e.g. col. 3 1n. 29 - col. 4 1n. 2.

Keilmann does not disclose or suggest, “a source of light with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element” as recited in claim 1 and “with a mode profile that provides an electric field which has a vector component substantially perpendicular to the surface of the optical element” as recited in claim 14. The Office’s attention is respectfully directed to col. 1, lines 60-65 in Keilmann which states, “It is an object of the invention to provide a scanning tip in which the transmission of optical radiation between a region of large cross-section . . . and an end aperture small compared to a wavelength.” Additionally, the Office’s attention is respectfully directed to FIG. 2 and to col. 2, line 66 to col. 3, line 2 in Keilmann, which states, “The internal cross-section of the hollow waveguide segment decreases continuously along an axial or radial propagation direction z from a point $z = -a$ to

an end aperture 14 at $z = +d$, the decrease preferably being linear.” Accordingly, Keilmann merely teaches a scanning tip with a tapered shaped for capturing and directing radiation from a larger opening to a smaller opening. Keilmann does not teach or suggest what is the source of this incoming radiation, let alone any characteristics of the incoming radiation. Applicants respectfully request the Office to specifically identify support for its assertion that the radiation mentioned in Keilmann teaches the claimed limitations or withdraw this rejection.

In sharp contrast, the present invention discloses in paragraph 32 in the above-identified patent application that, “The electric field component of the focused light 24 perpendicular to the surface of the solid immersion lens 16(1), referred to as the longitudinal field, creates a highly localized enhanced field at the surface of the lens 16(1) by the structure 18(1). Since the structure 18(1) is in the vicinity of the surface 26 of the object 12, the enhanced field 34 protrudes into the space outside the solid immersion lens 16(1) thereby enabling a highly localized interaction with the surface 26 of the object which is close by. The lateral extent of the enhanced field 34 is smaller than the size of diffraction illumination and can reach down to about ten nm.” Accordingly, with the present invention with the claimed light source the lateral extent of the field can reach about 10 nm.

Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 1 and 14. Since claims 2-5 and 7-8 depend from and contain the limitations of claim 1 and claims 15-18 and 20-21 depend from and contain the limitations of claim 14, they are distinguishable over the cited references and are patentable in the same manner as claims 1 and 14.

Keilmann does not disclose or suggest, “wherein the structure is elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one tapered end tip adjacent the surface of the optical element” as recited in claim 27, or “wherein the structure is formed to be elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one tapered end tip adjacent the surface of the optical element” as

recited in claim 36, or “wherein the structure is elongated and wherein one end of the elongated structure has a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one pointed tip adjacent the surface of the optical element” as recited in claims 54 and 56.

The Office’s attention is respectfully directed to FIG. 2 in Keilmann which clearly illustrates that the rod 20 is substantially straight and does not have a tapered section that begins to taper at location spaced in from the surface of the optical element and converges to one tapered end tip adjacent the surface of the optical element. Additionally, col. 3, lines 43-45 in Keilmann only states, “The rod 20 has a circular cross-section” and makes no mention or suggestion of any type of tapered section or convergence of the tapered section to one pointed tip.

As discussed in paragraphs 38 and 39 in the above-identified patent application, by shaping the structure to have a pointed tip a highly localized, enhanced field can be provided. This enhanced field which results from the pointed tip allows for a highly localized interaction with the surface 26 of the object 12. Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 27, 36, 4, and 56. Since claims 29-30 depend from and contain the limitations of claim 27, claims 38-39 depend from and contain the limitations of claim 36, claim 55 depends from and contains the limitations of claim 54, and claim 57 depends from and contains the limitations of claim 56, they are distinguishable over the cited references and are patentable in the same manner as claims 27, 36, 54, and 56.

The Office has rejected claims 45-46, 48-50, and 52 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,342,503 to Shafer (Shafer). The Office asserts Shafer discloses in FIG. 6: an elliptical shaped mirror (the mirror surface 28 is spherical); at least one structure 10’ positioned to optically interact with the elliptical shaped mirror; and a source of light with a mode profile that provides an electric field which has a vector component substantially perpendicular to a surface of the elliptical shaped mirror, the structure 10’ directing at least a portion of the light (via its transparent portion) onto at least a portion of the elliptical shaped mirror 28, the elliptical shaped mirror 28 focusing the portion

of light onto another substantially opaque portion 14 of the structure 10' enhancing the electric field of the light which optically interacts with an adjacent object.

Shafer does not disclose or suggest, "the structure reflecting at least a portion of the light on to at least a portion of the elliptical shaped mirror, the elliptical shaped mirror focusing the at least a portion of the light on to at least another substantially opaque portion of the structure enhancing the electric field of the light which optically interacts with an adjacent object" as recited in claim 45 or "reflecting light with at least a portion of the structure on to at least a portion of the elliptical shaped mirror, the elliptical shaped mirror focusing the light on to at least another substantially opaque portion of the structure enhancing the electric field of the light which optically interacts with an adjacent object" as recited in claim 49.

The Office has asserted Shafer discloses the shell 10' (which the Office asserts is the claimed structure) that directs at least a portion of the light via its transparent portion onto at least a portion of the second shell 28 (which the Office has asserts is the elliptical shaped mirror 28) and the second shell 28 focuses the portion of light onto another substantially opaque portion 14 of the structure 10'. However, nowhere does Shafer disclose or suggest the shell 10' reflects at least a portion of the light on to at least a portion of the elliptical shaped mirror. In fact, based on the configuration for the device shown in FIG. 6 in Shafer, if the concave shaped shell 10' reflected any of the incoming light (illustrated by the arrows in FIG. 6 in Shafer), there is no way the light could be reflected on to the second shell 28 which is behind or downstream from the shell 10'.

Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 45 and 49. Since claim 46 depends from and contains the limitations of claim 45 and claims 50 and 52 depend from and contain the limitations of claim 49, they are distinguishable over the cited references and are patentable in the same manner as claims 45 and 49.

Shafer also does not disclose or suggest, "wherein the structure is elongated and has at least one tip and the elliptical shaped mirror focuses the at least a portion of the

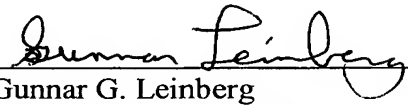
light on to the at least one tip" as recited in claim 48. The Office has asserted that the shell 10' is elongated and has at least one tip, however as shown in FIG. 6 the second shell directs the light towards the center of the shell 10' where a mirror 14 is located. Nowhere does Shafer teach or suggest an elliptical shaped mirror that focuses the light on to the tip of the structure. Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claim 48.

Applicants have also added new dependent claims 53-59 which are believed to be distinguishable over the cited references and in condition for allowance. A notice to this effect is respectfully requested.

In view of all of the foregoing, Applicants submit that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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